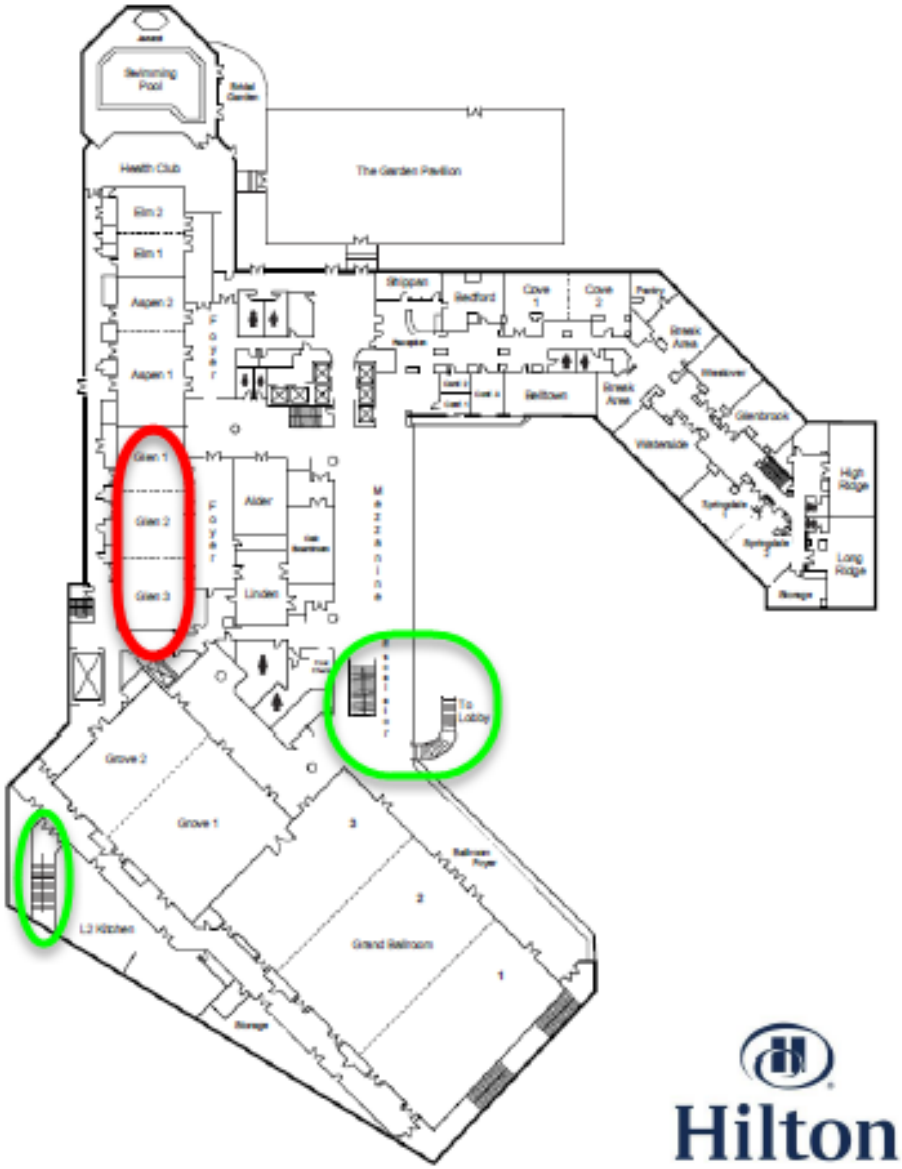
North America
Regional Marine Forum – Stamford

March 2018

OCIMF

Safety Brief and Arrangements



Hilton

Welcome and Introduction

Rob Drysdale – Senior Technical Adviser (OCIMF)

Safety Moment

https://www.youtube.com/watch?v=5Gtio4V1L3o

Regional Marine Forum Objective

- Engage with OCIMF and non OCIMF members
- Encourage industry to utilize and be aware of the work of OCIMF
- Learn from one another
- Review regional challenges

Critical Success Factors

- **Actively participate**
- **Make sure your voice is heard and your points communicated**
- **Ask Questions**
- **Network**

Anti-Trust/Competition Law Guidance - DO NOT

Discuss the following topics:

- Prices/Freight Rates, Production, Capacity or inventions
- Sales/purchases, Costs, Future business plans
- Matters relating to individual customers/suppliers
- Employee compensation, benefits, remuneration etc.

Make any agreement on, or take a decision to conduct the following activities:

- Fix Sale or purchase prices
- Fix other terms of sale or purchase
- Restrict capacity or output
- Refrain from supplying a product or service
- Limit quality competition or research
- Divide Markets or customers
- Exclude competing companies from a market
- Blacklist or boycott customers or suppliers

Anti-Trust/Competition Law Guidance – DO

Limit meeting discussions to agenda topics, Items for any other business should be discussed with the meeting Chairman beforehand.

Object if an improper or questionable subject is raised and ensure your objection is recorded in the minutes.

Seek Advice from OCIMF General Counsel and OCIMF Legal Committee before participating in the following potentially sensitive activities:

- Gathering and exchanging statistical information
- Benchmarking
- Creating Industry Standards
- Self-policing regulations
- OCIMF sponsored research
- Consult with OCIMF General Counsel and OCIMF Legal Committee on all questions which might be related to anti-trust/competition law

Formalities & Agenda

Rob Drysdale – Senior Technical Advisor

slido.com

#NARMF2

Meeting Practicalities

Business Cards

Sign Attendance Sheet

Cell Phones - *Respectful*

Group Photo

Morning Agenda

I. Introduction and Welcome
0900-0930

II. Mooring Equipment Guidelines (MEG) and the IMO
0930 – 1100

- **MEG 4 Update** – Joe Megeed, OCIMF
- **Vessel Zarga Incident** – Alan Blume, Republic of the Marshall Islands
- **Current IMO Status** – Joe Megeed, OCIMF
- **MEG for Terminals** – Walter Sonne, Chevron

Coffee Break – 15mins

III. OCIMF Programmes – MTIS and SIRE
1115 – 1330

- **Marine Terminal Information System** – Marta Krogstad, Chevron
- **SLOM** – Francisco Barreto, SLOM
- **SIRE and OVID** – Patrick McGroggan, OCIMF
- **Ship Operator views of Vetting and SIRE** – Stefanos Stylianos, Minerva Marine

Lunch Break – 45mins

Afternoon Agenda

IV. Best Practice and Lessons Learned
1415 – 1530

- **OCIMF & INTERTANKO Joint Safety Initiative** – Dr. Phillip Belcher, INTERTANKO
- **Recent Near Miss on Seaways Luzon** – William Nugent, International Seaways
- **Contractor injured during offshore buoy deployment** – Jerry Higdon, Husky Energy

Coffee Break – 15mins

V. OCIMF Updates
1545 – 1630

- **OCIMF Secretariat** – Joe Megeed, OCIMF
- **Publications** – Rob Drysdale, OCIMF
- **Meeting wrap-up**– Joe Megeed, OCIMF

VI. OCIMF Reception 1700 – 1900

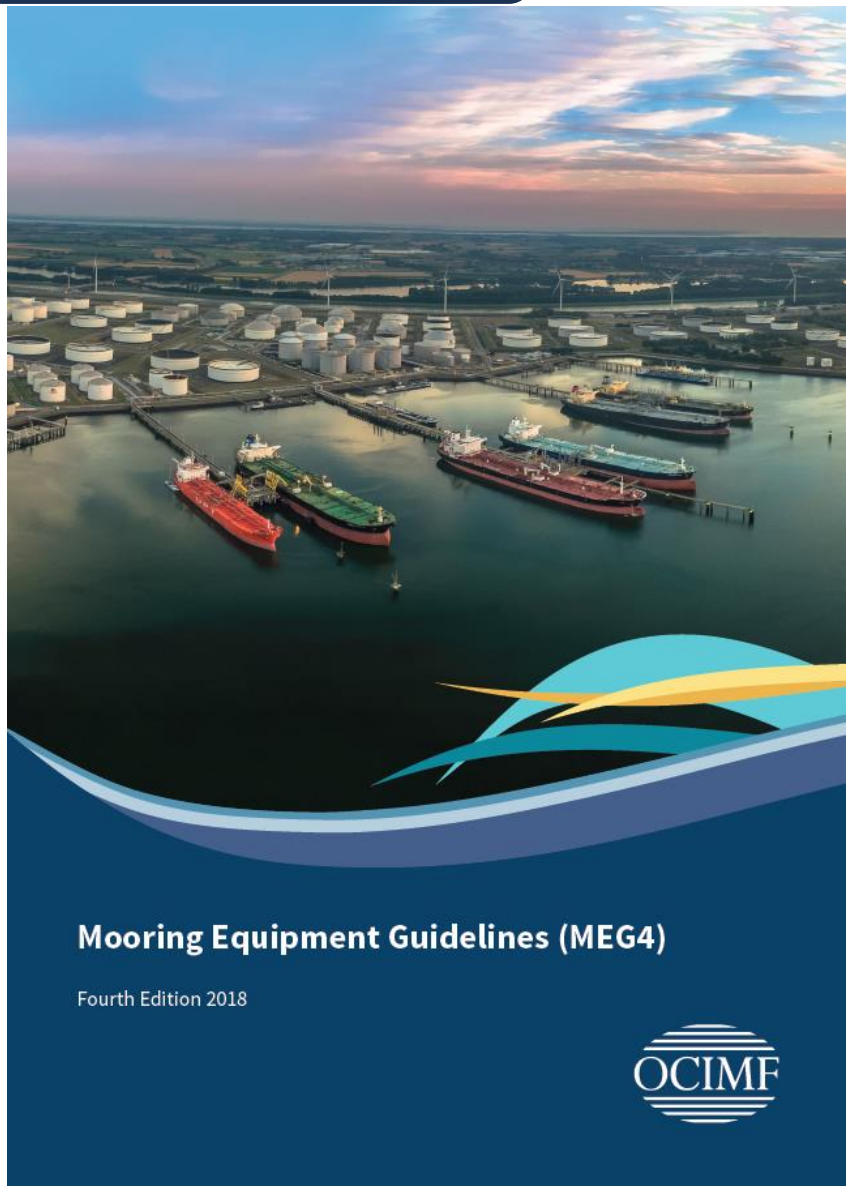
A Voice for Safety

Mooring Equipment Guidelines (MEG) publication update

Joe Megeed – Technical Adviser (Engineering)

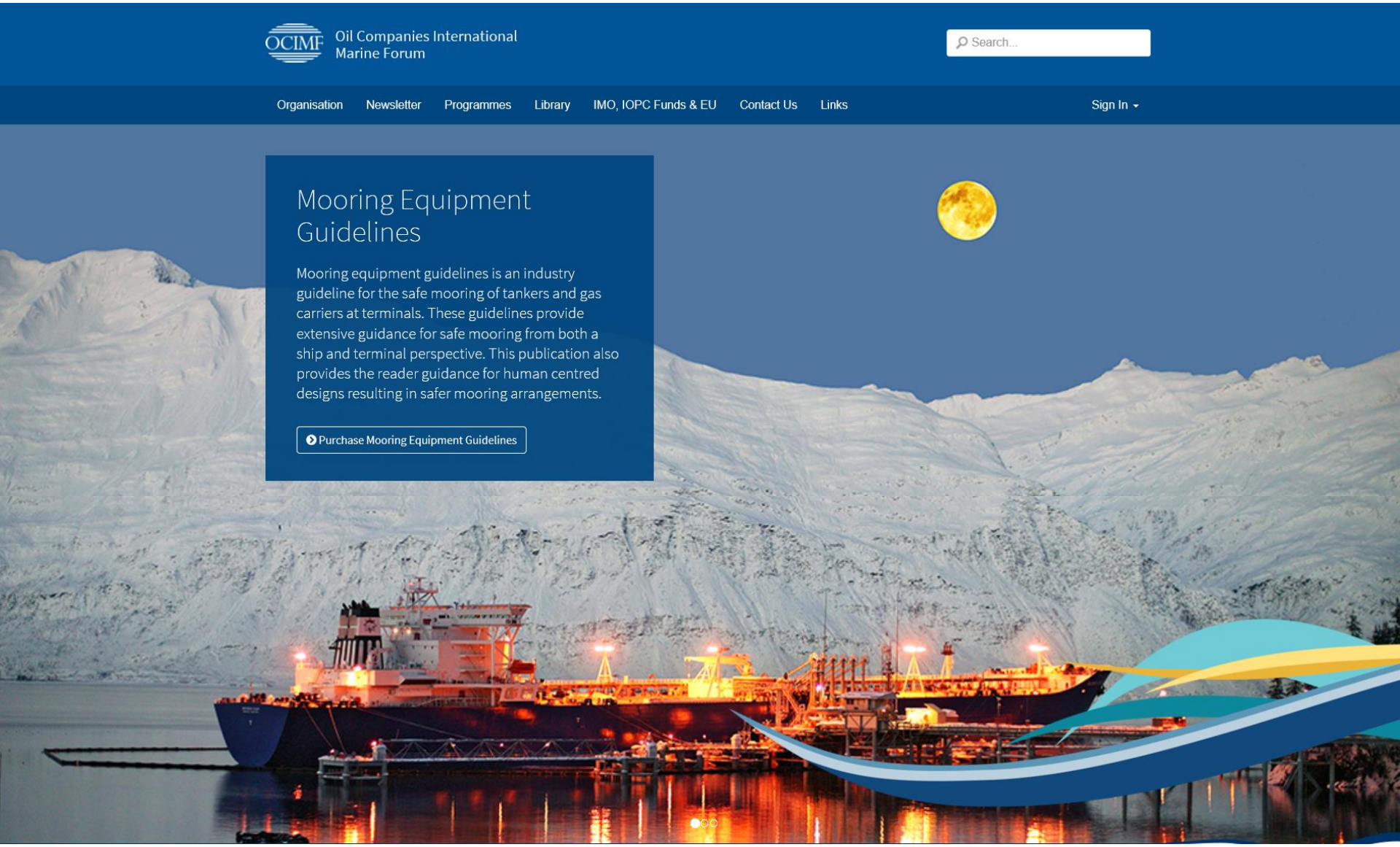
OCIMF

MEG 4


Mooring Equipment Guidelines (MEG4)
Fourth Edition 2018
OCIMF

Chapters

MEG 4 Website



MEG 4 Website

New Terminology

During the revision of MEG it was clear there is confusion in the shipping industry with the term Minimum Breaking Load (MBL) and other terminology relating to line strength.

Further, there was no industry guidance on condition based monitoring of mooring lines and tails. Since nearly all mooring injuries are a result of mooring line failures, OCIMF has strived to provide guidance and clarity on the condition monitoring of mooring lines. Below is a list of some new terms that will be introduced in MEG4. We also encourage you to visit the Clarifications section for further information.

Minimum Breaking Load Ship Design – MBL SD

MBL SD is the minimum breaking load of new, dry , mooring lines for which a Ship's mooring system is designed, in order to meet OCIMF Standard Environmental Criteria restraint requirements. The MBL SD is the core parameter against which all the other components of a Ship's mooring system are sized and designed, with defined tolerances.

Line Design Break Force – LDBF

LDBF is the minimum force that a new, dry, spliced, mooring line will break at, when tested according to Appendix D of MEG 4. This is for all cordage (synthetic) materials except Nylon which is tested wet and spliced. When selecting lines, the LDBF of a line shall be 100%-105% of the MBL SD. LDBF replaces the terms "MBL of the line" or "rope MBL", currently used in MEG 3.

Working Load Limit – WLL

WLL is the maximum load that a mooring line should be subjected to in operational service, calculated from the MEG 4 Standard Environmental Restraint criteria. The WLL of mooring lines should be used as user operating limiting values, not to be exceeded.

Line Management Plan – LMP

LMP is used to manage the operation and retirement of mooring lines and tails. The LMP also documents the requirements, assumptions and evaluation methods used in determining the line retirement criteria. The LMP is specific to an operator, Ship type, and trade route; however, MEG4 gives general guidance on establishing a LMP.

MEG 4 Website

Feedback to OCIMF

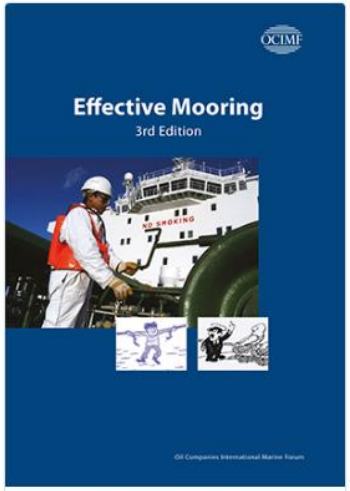
If you have a query relating to MEG4, please first visit the Clarifications section where the answers to the many commonly asked questions can be found

Leave Feedback

Templates | Related Publications | Related Links | Clarifications | Gallery

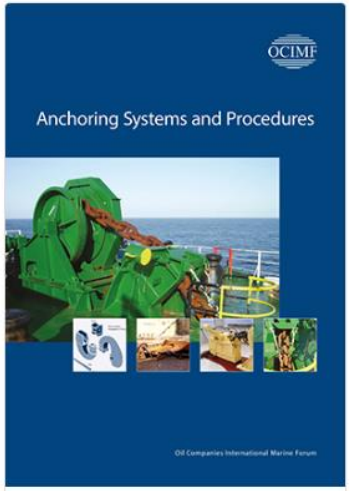
Related Publications

This section provides links to OCIMF and other industry guidance they may be of benefit with respect to mooring design and operations.



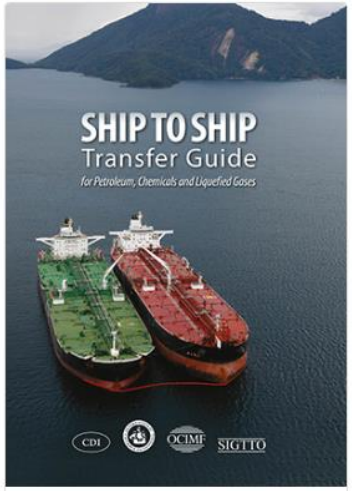
Effective Mooring

This popular title, now in its third edition, provides practical guidance on the basic principles of mooring. This booklet will be



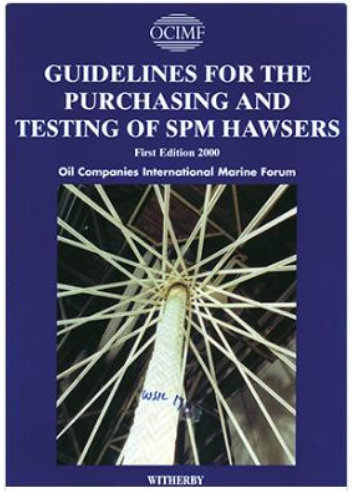
Anchoring Systems and Procedures

This publication highlights the design capabilities and limitations of anchoring systems and



Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases

This industry guide provides recommendations on STS



Guidelines for the Purchasing and Testing of SPM Hawsers

Provides detailed specifications and guidelines for specification, purchasing and testing of SPM

MEG 4 Website

Feedback to OCIMF

If you have a query relating to MEG4, please first visit the Clarifications section where the answers to the many commonly asked questions can be found

Leave Feedback

Templates | Related Publications | Related Links | Clarifications | Gallery

Related Links

IMO

The International Maritime Organization – is the United Nations specialized agency with responsibility for the safety and security of shipping and the prevention of marine pollution by ships.

EMSA

The European Maritime Safety Agency was established to ensure a high, uniform and effective level of maritime safety, maritime security, prevention of, and response to, pollution caused by ships as well as response to

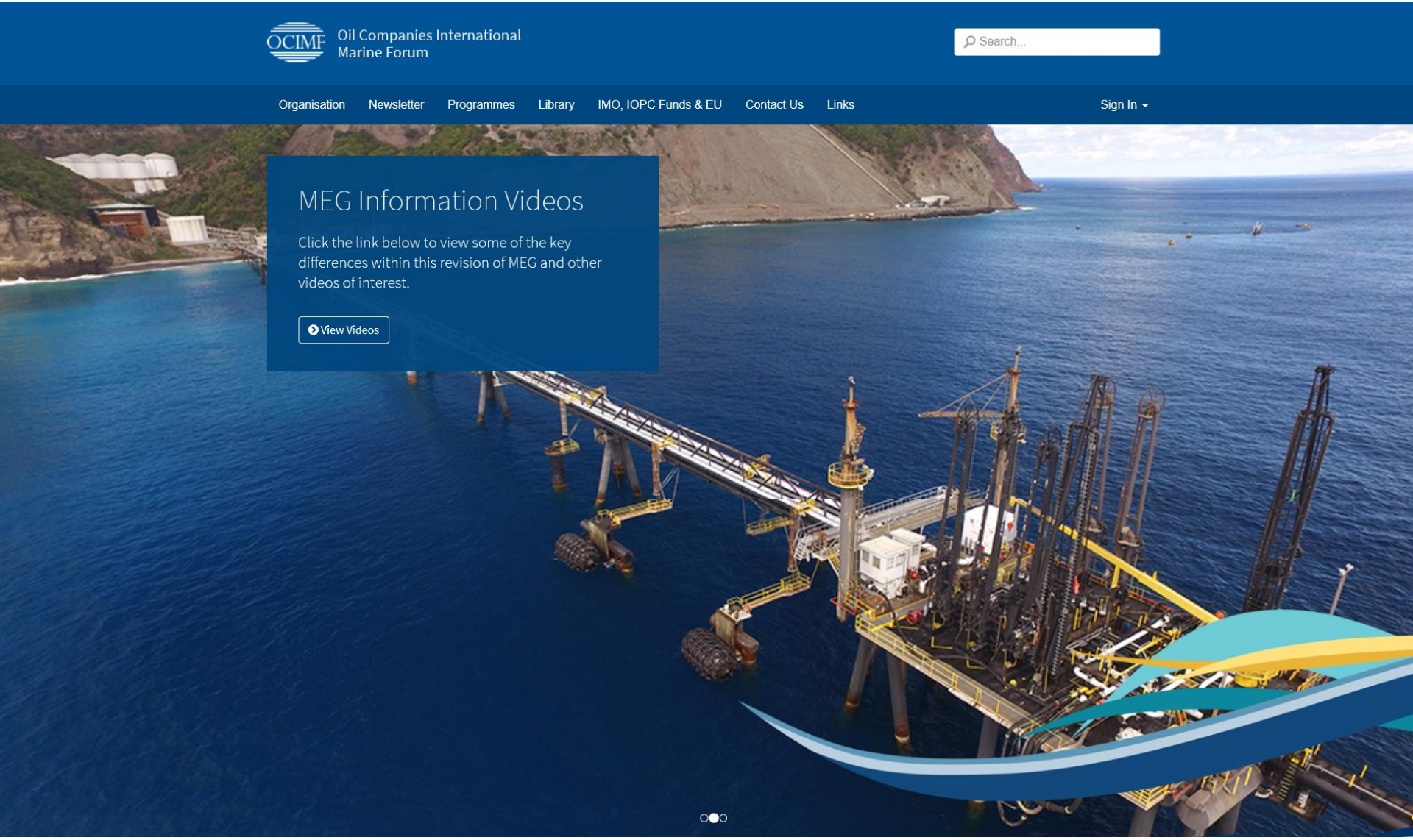
MAIB

The MAIB investigates marine accidents involving UK vessels worldwide and all vessels in UK territorial waters.

IACS

Dedicated to safe ships and clean seas, IACS makes a unique contribution to maritime safety and regulation through technical support, compliance verification and research and development.

MEG 4 Website



A Voice for Safety

ZARGA MOORING DECK ACCIDENT LESSONS LEARNED

Oil Companies International Marine Forum (OCIMF) North America
15 March 2018

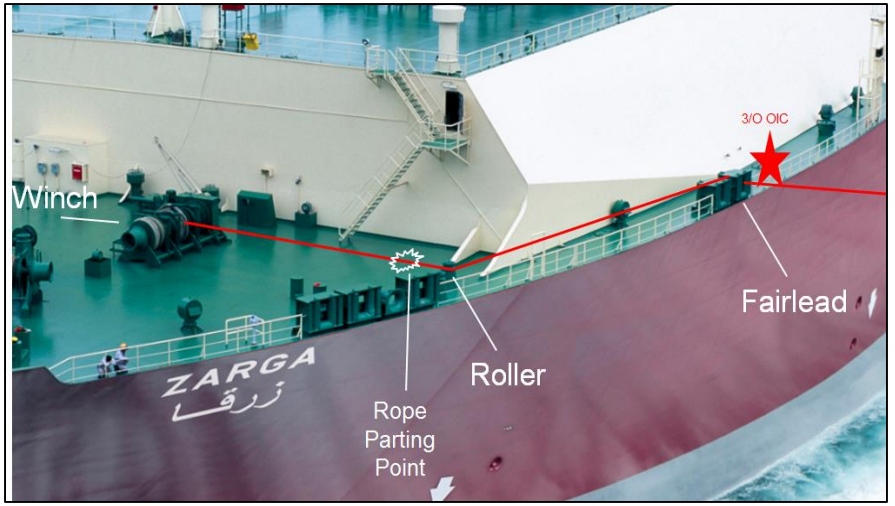
Presented by:

Alan Blume

Marine Investigations Manager

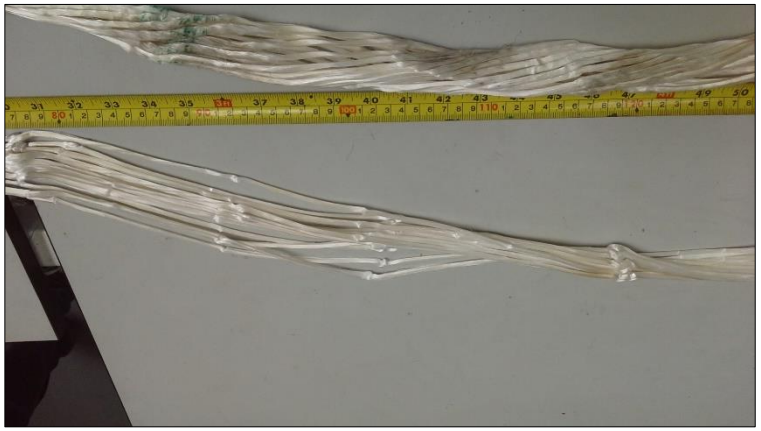
ZARGA MOORING DECK ACCIDENT

- Occurred on 2 March 2015 at Milford Haven
- An ultra-high modulus polyethylene (UHMPE) fiber line fitted to a 22 meter (m) polyethylene tail failed while being tensioned to warp the vessel along the berth
- The Third Officer was seriously injured when struck by the failed line
- Joint investigation by the United Kingdom (UK) and the Republic of the Marshall Islands (RMI)
- Report available on the Marine Accident Investigation Branch (MAIB) website



FAILURE OF UHMPE FIBER MOORING LINE

- Loss of strength over time due to kink bands created by axial compression
  - Minimum breaking load of the line was 137 tons, failed at 24 tons
- Service related causes of axial compression include: twisting of the line, bending around improperly sized deck fittings, and cyclic loading
- Jacketed core prevented detection of damaged fibers
- Snap back underestimated



IMPROPERLY SIZED DECK FITTINGS

- Manufacturer's guidance stated the ratio of the diameter of the deck fittings to the diameter of the mooring line (D/d) was critical
- Minimum recommended D/d of 12:1 for lines on board ZARGA
  - Pedestal roller D/d = 10.22
  - Roller fairlead D/d = 9.1
- Factors related to mooring lines not taken into account when fittings were selected by the builder

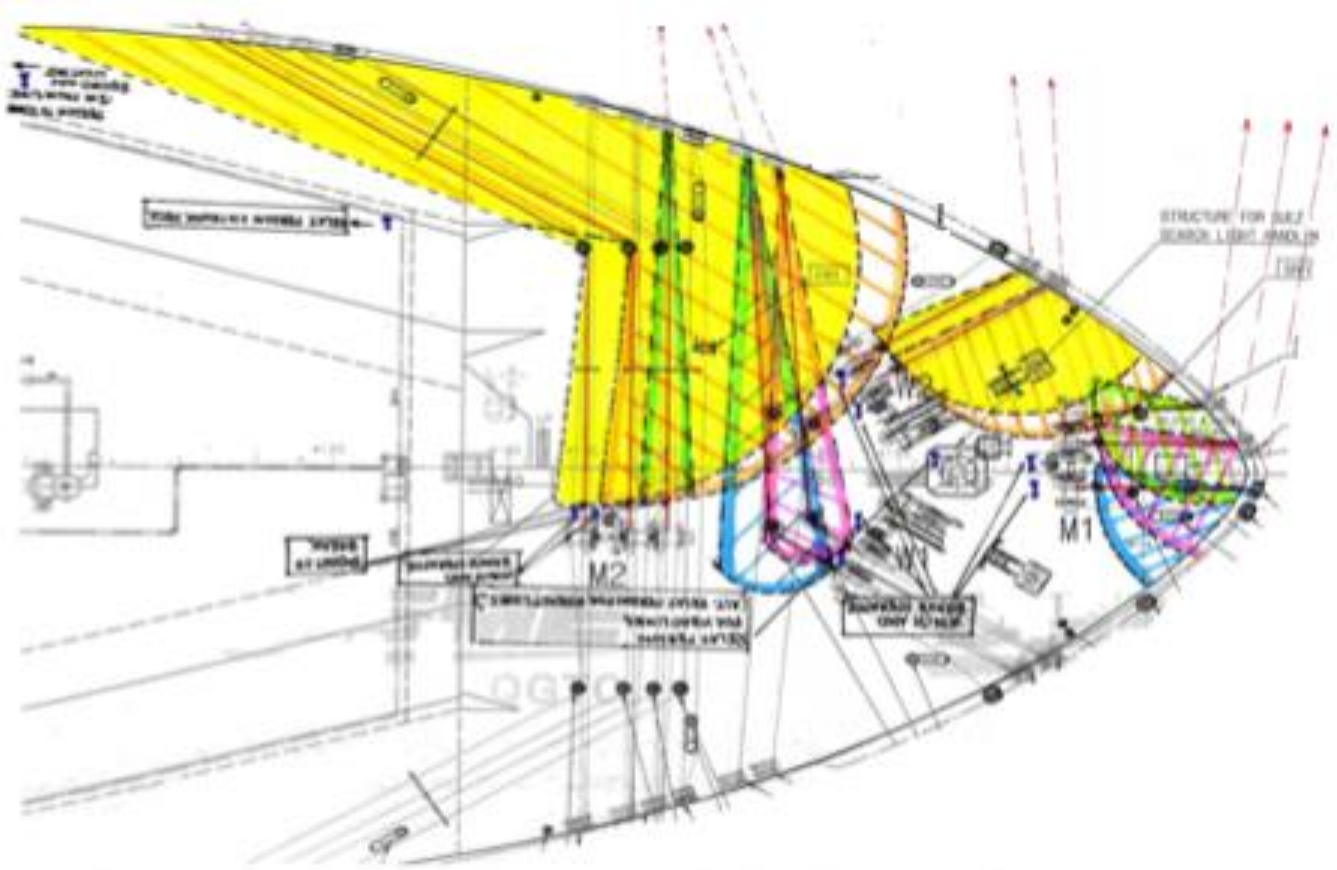
SNAP BACK DURING DESTRUCTIVE TESTING

SNAP BACK ZONES - ORIGINAL






SNAP BACK ZONES - REVISED








SOME OF THE LESSONS LEARNED

- The potential for snap back due to the use of polyethylene tails was underestimated
- The arrangement of the mooring deck meant that the entire foredeck area and portions of the main deck adjacent to the cargo dome were a snap back zone
- The line manufacturer's guidance regarding minimum D/d ratio was not taken into account during the selection of deck fittings during new construction
- The potential for significant reductions in line strength due to axial compression was recognized by the line manufacturer
- The jacketed core construction rendered ship management's line inspection procedures ineffective






COORDINATION WITH INDUSTRY

- Throughout the marine safety investigation, there was good coordination between the investigating States, ship management, the line manufacturer, and the OCIMF
- This coordination has crossed over to participation in the ongoing work being done at the International Maritime Organization (IMO) related to mooring deck issues
- Focus has included:
  - Addressing seafarer safety when designing the layout of mooring decks
  - Ensuring mooring lines are considered, starting with the design phase, as part of a vessel's mooring system






THANK YOU

www.register-iri.com



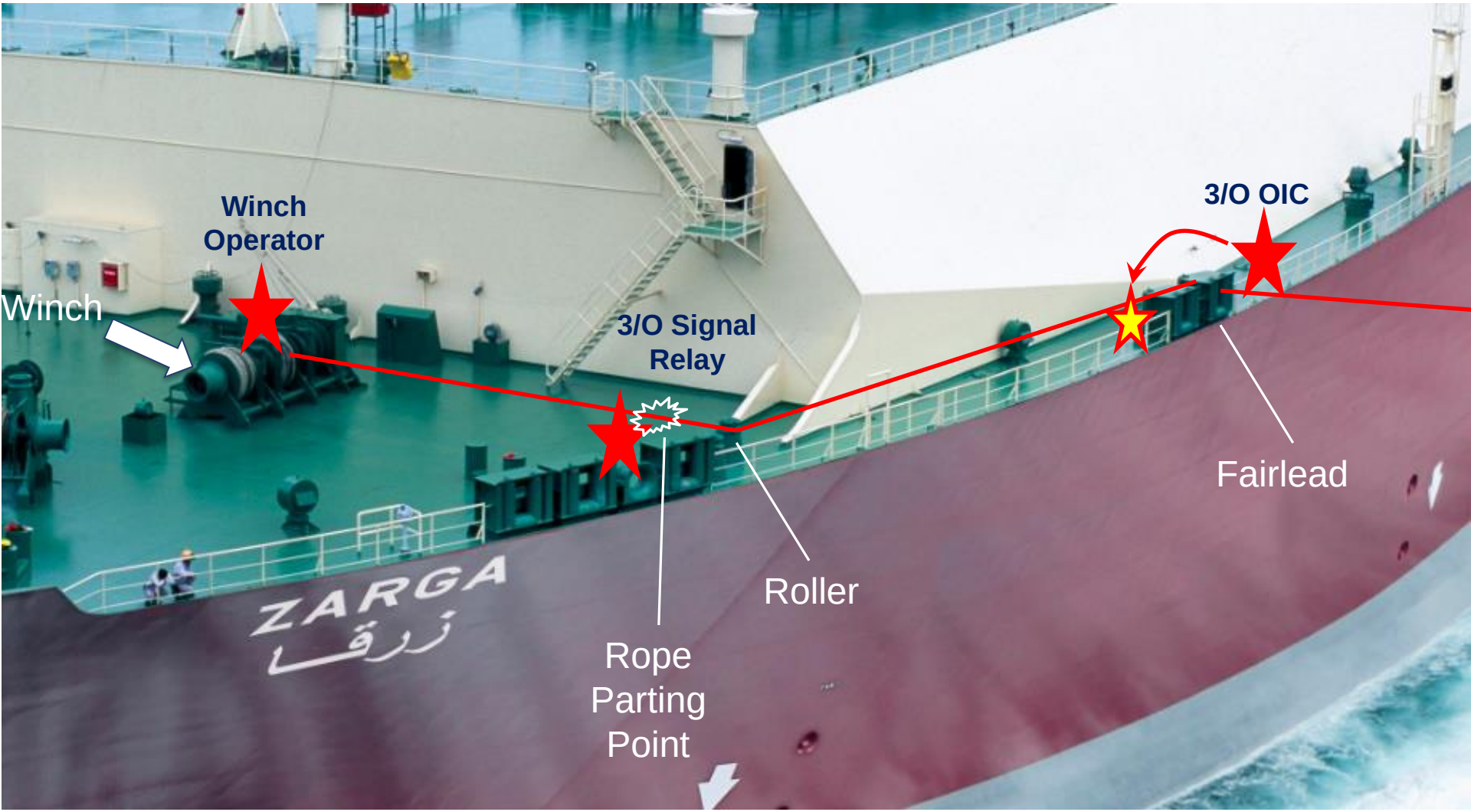



Mooring Equipment Guidelines (MEG) and the International Maritime Organisation (IMO)

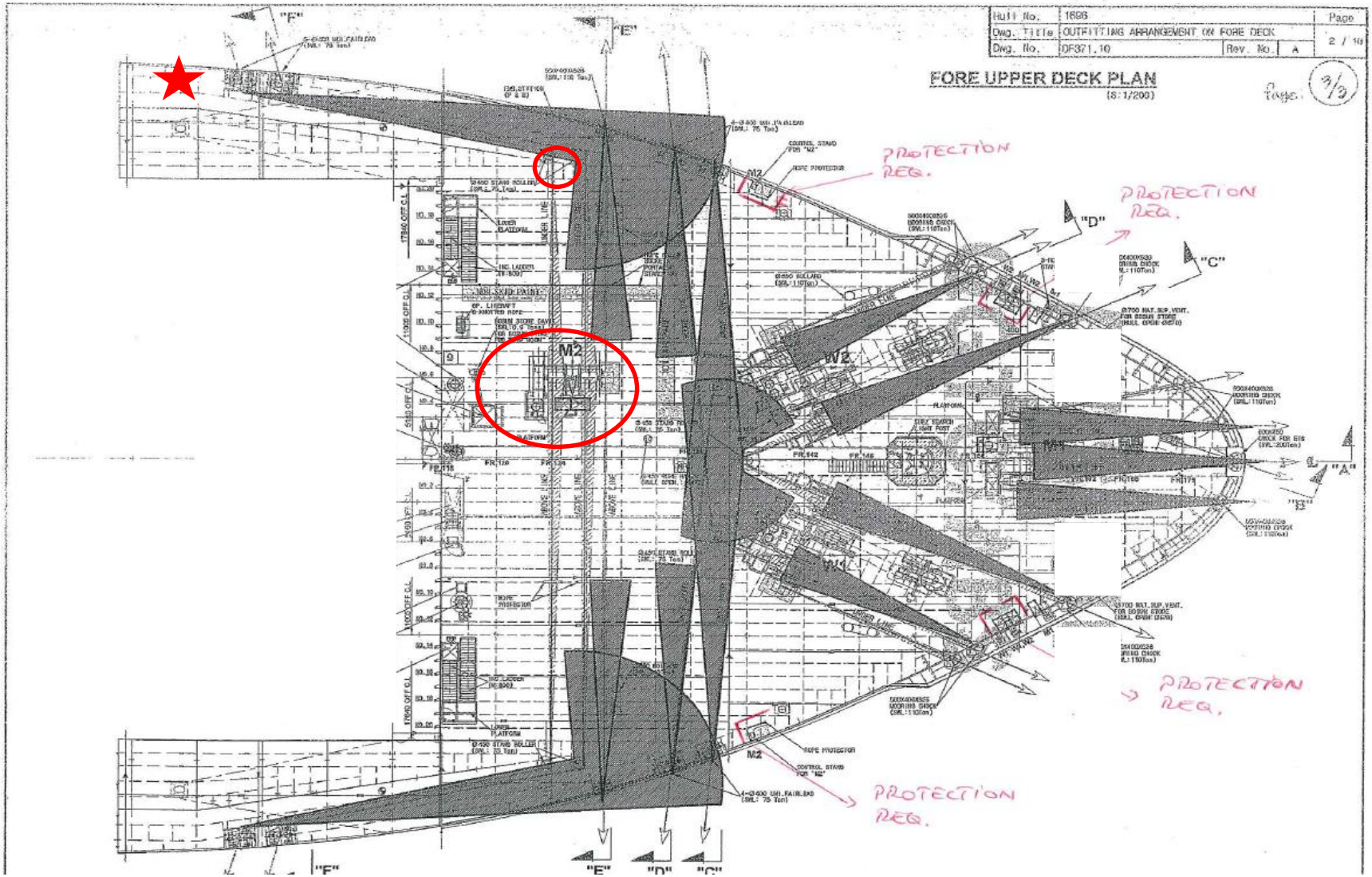
Joe Megeed – Technical Adviser (Engineering)

OCIMF

Zarga


Winch Operator
Winch
3/O Signal Relay
3/O OIC
Fairlead
Roller
Rope Parting Point
ZARGA
زرقا

Snapback Zone

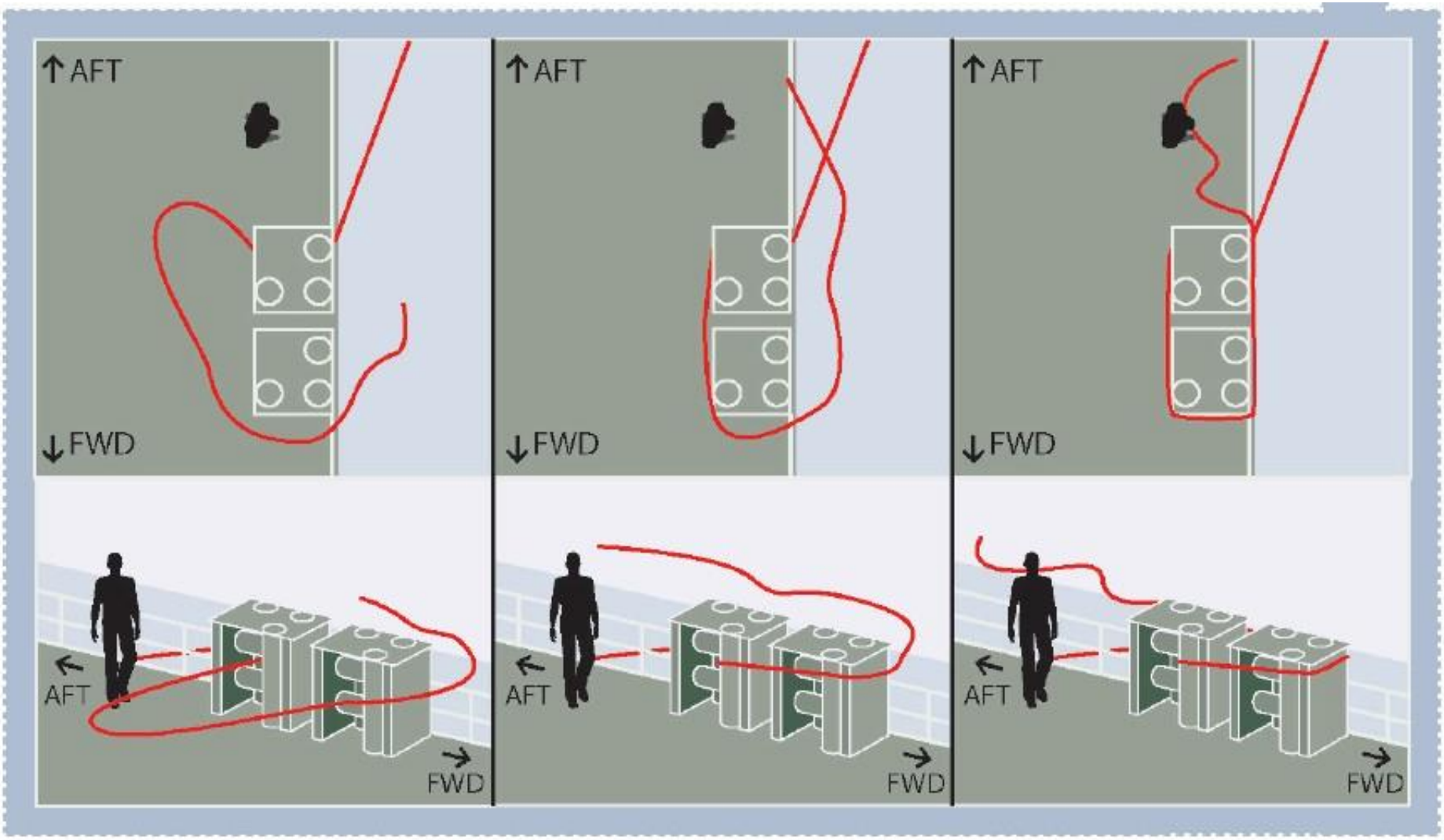


Mooring Equipment Guidelines (MEG4)
Key Messages

1. **Snap-back**
   - Complex
   - No safe area
2. **Fit-for-purpose ropes**
   - HMSF vs others
   - Purchasing
   - Monitor usage
3. **Human Factors (HCD)**
   - Design
   - Operations & Maintenance

Equipment, ropes, tails and layout should be designed, operated and maintained as an integrated mooring system

Complex Snap-back



Fit for Purpose Lines

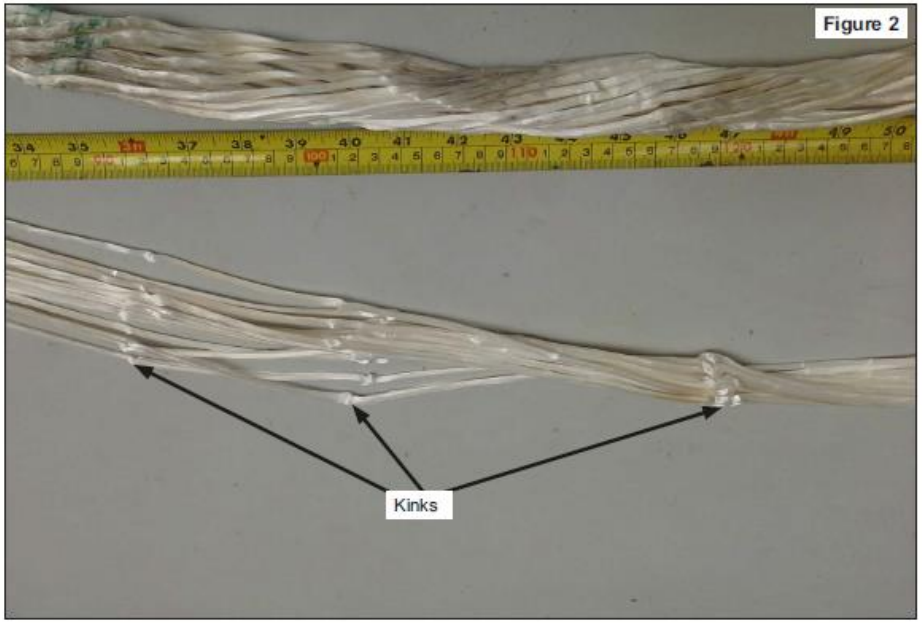
Mooring Line:

MBL = 137 tonnes failed at 24 tonnes

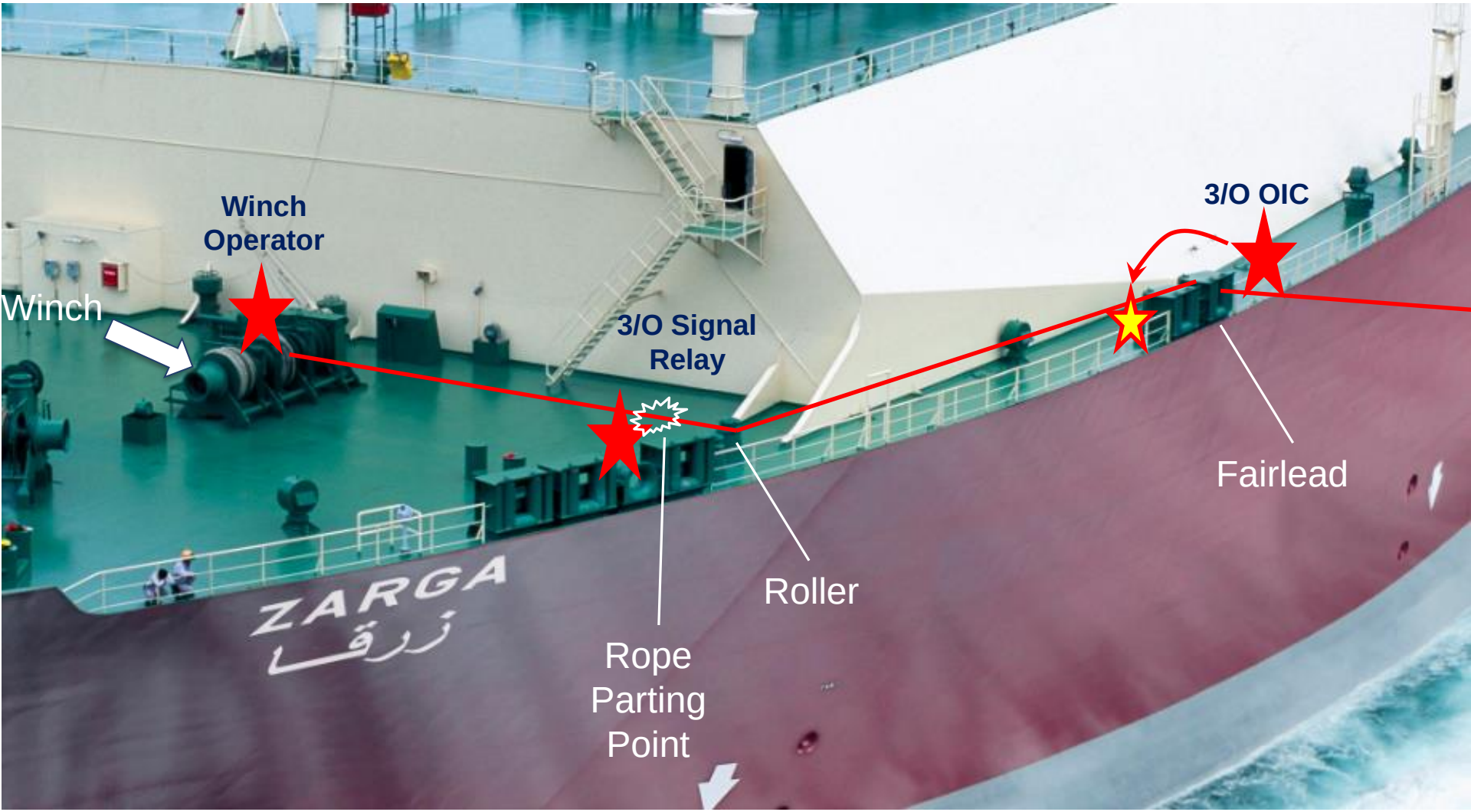
Life expectancy = 8 years failed at 5 years

Source:

https://assets.digital.cabinet-office.gov.uk/media/56b8c217e5274a0369000013/MAIBSafetyBulletin_1-2016.pdf



Human Factors

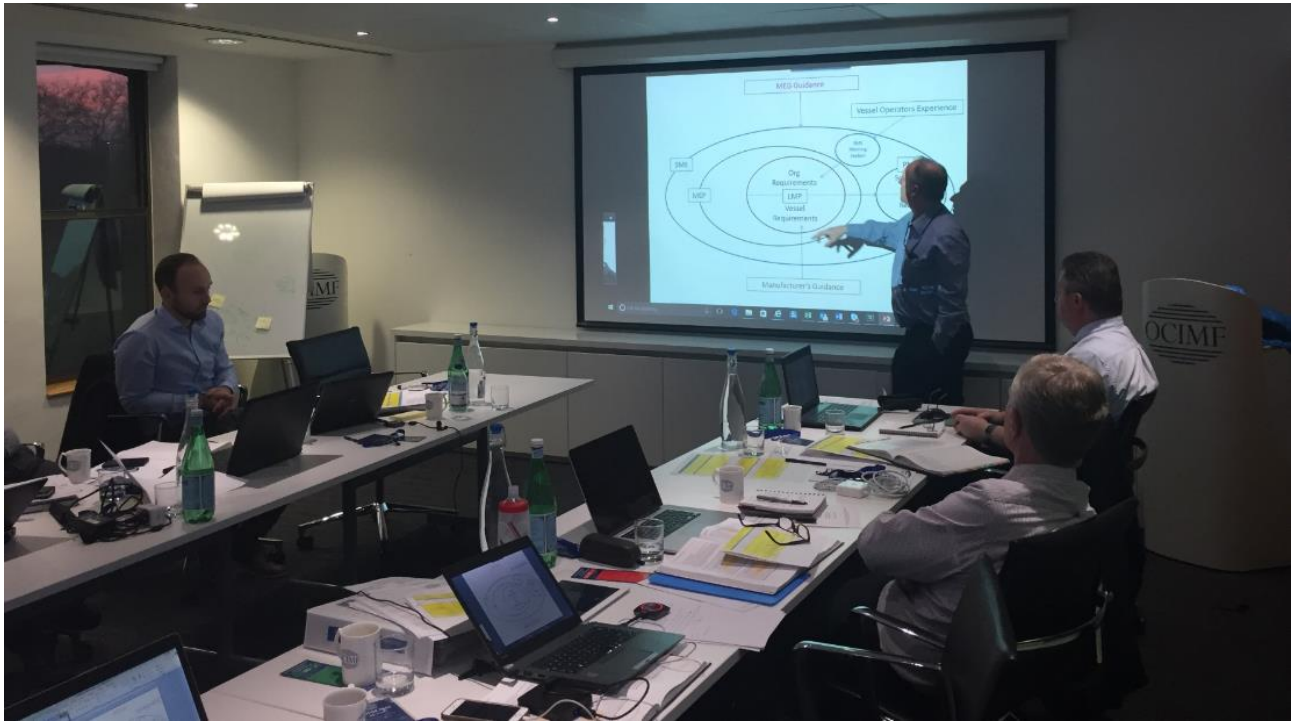


How can MEG aid the IMO?

Industry Team work:

Engagement with MAIB IACS Ship Owners / Operators

Ports and Terminals Mooring Line Manufacturers



Making a Regulation

IMO Goal Based Standards

http://www.imo.org/en/OurWork/safety/safetytopics/pages/goal-basedstandards.aspx

Current SOLAS

Regulation 3-8

Towing and mooring equipment

1 This regulation applies to ships constructed on or after 1 January 2007, but does not apply to emergency towing arrangements provided in accordance with regulation 3-4.

2 Ships shall be provided with arrangements, equipment and fittings of sufficient safe working load to enable the safe conduct of all towing and mooring operations associated with the normal operation of the ship.

3 Arrangements, equipment and fittings provided in accordance with paragraph 2 shall meet the appropriate requirements of the Administration or an organization recognized by the Administration under regulation I/6.†

4 Each fitting or item of equipment provided under this regulation shall be clearly marked with any restrictions associated with its safe operation, taking into account the strength of its attachment to the ship's structure.

Known Mooring Incidents

IMO:

MSC 95/19/13 – Japan had more than 90 accidents in five years with two losses of lives.

SDC 4/INF.3 – ICHCA International Ltd. (ICHCA), 42 incidents, 25 line failures, 20+ loss of life; over 22 years

Known Mooring Incidents

MAIB:

Between 2007 and 2016:

- **37 mooring line failures or snapbacks resulting in three fatalities and 23 injuries.**

Source: MAIB January 2018

SDC5 Draft SOLAS

DRAFT AMENDMENTS TO SOLAS REGULATION II-1/3-8

The existing regulation 3-8 is replaced with the following:

"*Towing and mooring equipment*

7 For ships of 3,000 gross tonnage and above the design of the mooring arrangement and the selection of appropriate mooring equipment including lines shall be based on guidelines developed by the Organization**, applying a human-centred design approach.

8 Ships of less than 3,000 gross tonnage shall comply with the requirement in paragraph 7 above as far as reasonably practicable, or with applicable national standards of the Administration which provide an equivalent level of safety.

9 For all ships, mooring equipment including lines shall be inspected and maintained in suitable condition for their intended purposes***.

Draft IMO Guidelines

I. Guidelines for Mooring Design – *NEW*

GUIDELINES ON THE DESIGN OF MOORING ARRANGEMENTS AND THE SELECTION OF APPROPRIATE MOORING EQUIPMENT AND FITTINGS FOR SAFE MOORING

II. Guidelines for Selection, Inspection, and Retirement of Lines– *NEW*

GUIDELINES FOR INSPECTION AND MAINTENANCE OF MOORING EQUIPMENT INCLUDING LINES

Draft Mooring Design Guidance

4 Functional objectives

In order to achieve the goals for the correct equipment selection and mooring arrangement design safety objectives set out in paragraph [...], the following functional objectives should be applied. Ships shall be provided with mooring equipment and fittings, according to ship types:

.1 designed with systems to provide mooring personnel with the loads on the mooring lines during mooring operations and while the ship is moored to verify that the limitations of the lines are not exceeded;

.2 arranged to minimize obstructed access to and operation of the mooring equipment;

.3 arranged to minimize obstructed access to working space, and minimize obstructed view of the mooring area;

.4 arranged to minimize the need for complex mooring line configurations during the normal operation of the ship;

.5 selected and arranged to minimize the need for manual handling of mooring lines under load; and

.6 selected and arranged to minimize the exposure of personnel involved in mooring operations to the dynamic loads of mooring lines.

Knowing the Limits

IMO & OCIMF

SDC 6
2019

MSC 101
2019

SOLAS
[2024]?

OCIMF

**Ship Inspection Report (SIRE)
Programme**

It's a Journey…

Safe Mooring

IMO

DRAFT Language

1. Lines in SOLAS
2. HCD
3. Line tension monitoring

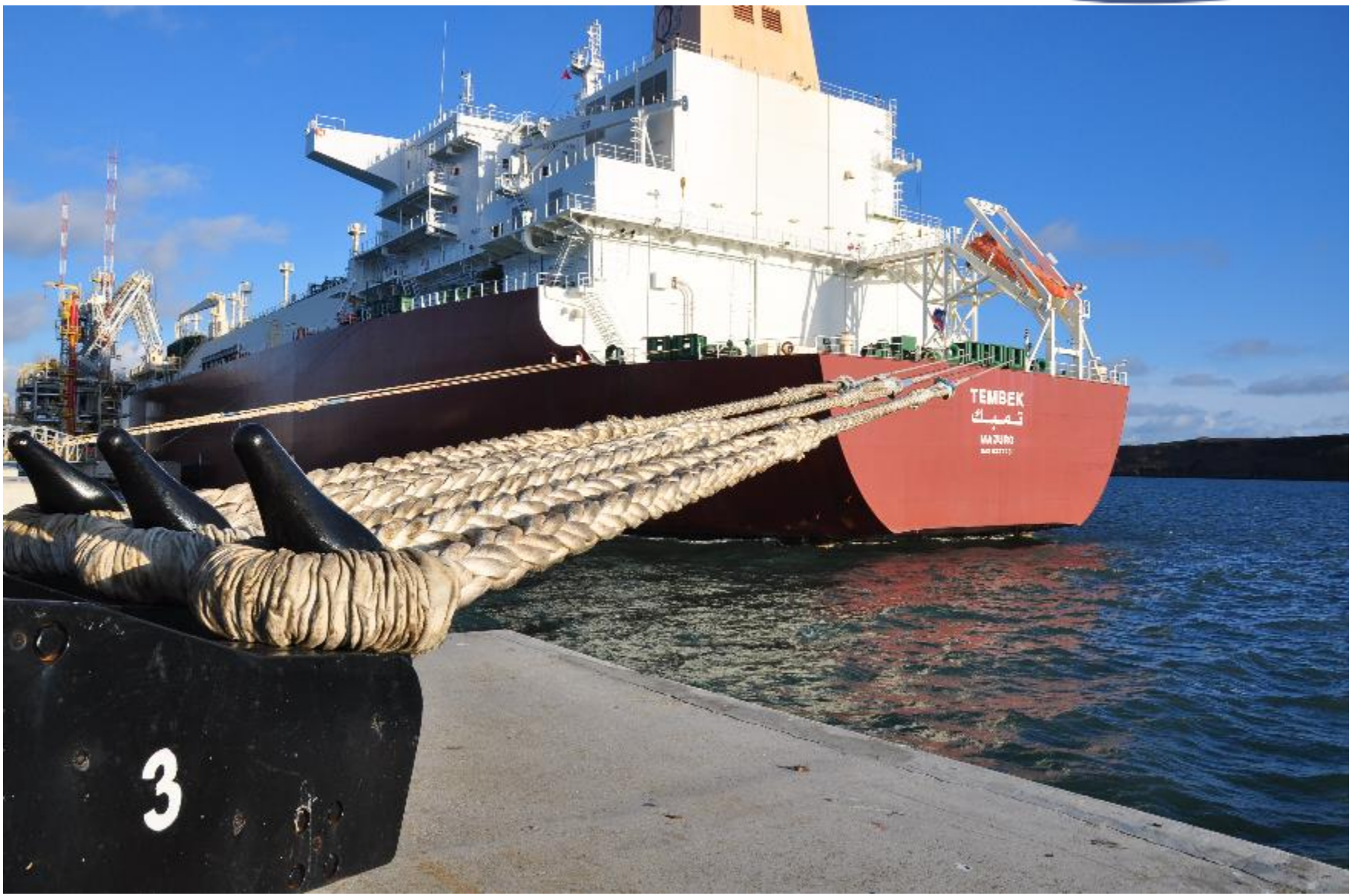
MEG

1. Snap-back is complex
2. Fit for purpose lines
3. Human Factors (HCD)

You

What are key items to send your crew home safely?

1. Line Tension Monitoring?
2. HCD Mooring?
3. Condition Monitor Lines?


TEMBEK
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3

OCIMF Publications

Rob Drysdale – Senior Technical Adviser (OCIMF)

Publications

Released in 2017

Books

- Recommendations for Oil and Chemical Manifolds and Associated Equipment
- Tanker Management and Self Assessment, Third Edition

Information papers

- Northern Sea Route Navigation
- The Guidelines On Cyber Security Onboard Ships
- Linked Ship/Shore Emergency Shutdown Systems for Oil and Chemical Transfers
- Inert Gas Systems The Use Of Inert Gas For The Carriage Of Flammable Oil Cargoes

Due release in 2018

Books

- Mooring Equipment Guidelines, Fourth Edition (MEG 4)
- Cargo Guidelines for F(P)SOs
- Guidelines for Offshore Tanker Operations
- Construction Specification for Marine Loading Arms
- Effective Mooring

Information papers

- Transfer of Personnel by Crane between Vessels
- Critical Spare Parts
- Industry Expectations for the Provision of Marine Terminal Information Regulations
- Marine Terminals Impacted by Ice or Severe Sub Zero Temperatures
- Navigational Audits and Assessments - A Guide to Best Practice
- Ship Security - Guidelines to Harden Vessels
- Volatile organic compounds (VOC) emissions white paper
- Transiting the Turkish Straits
- Joint INTERTANKO – Recommendations for Effective Sharing of Lessons Learnt from Incidents
- Joint INTERTANKO – Competency Assessment Verification

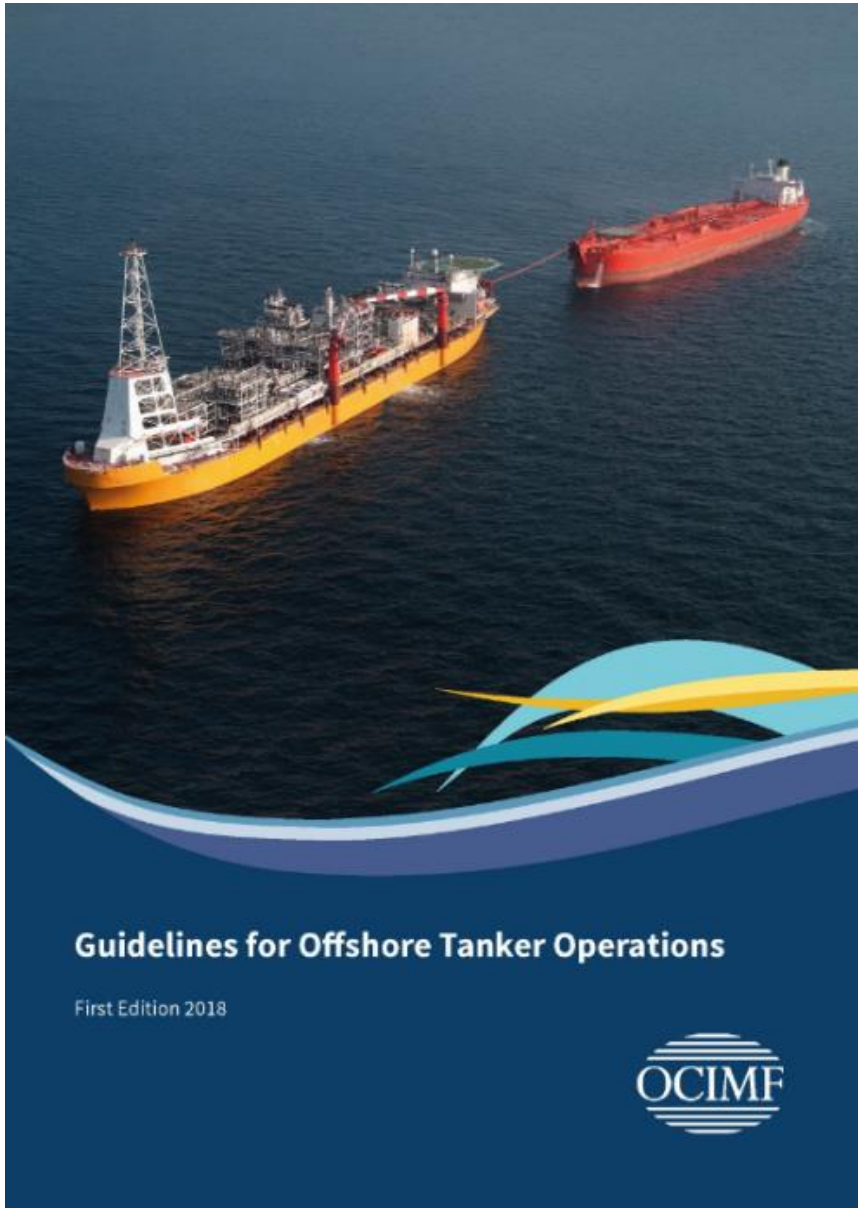
Guidelines for Offshore Tanker Operations (GOTO)

GOTO updates and supersedes the following OCIMF publications:

Offshore Loading Safety Guidelines with Special Relevance to Harsh Weather Zones.

Tandem Mooring and Offloading Guidelines for Conventional Tankers at F(P)SO Facilities.

Recommendations for Equipment Employed in the Bow Mooring of Conventional Tankers at Single Point Moorings.

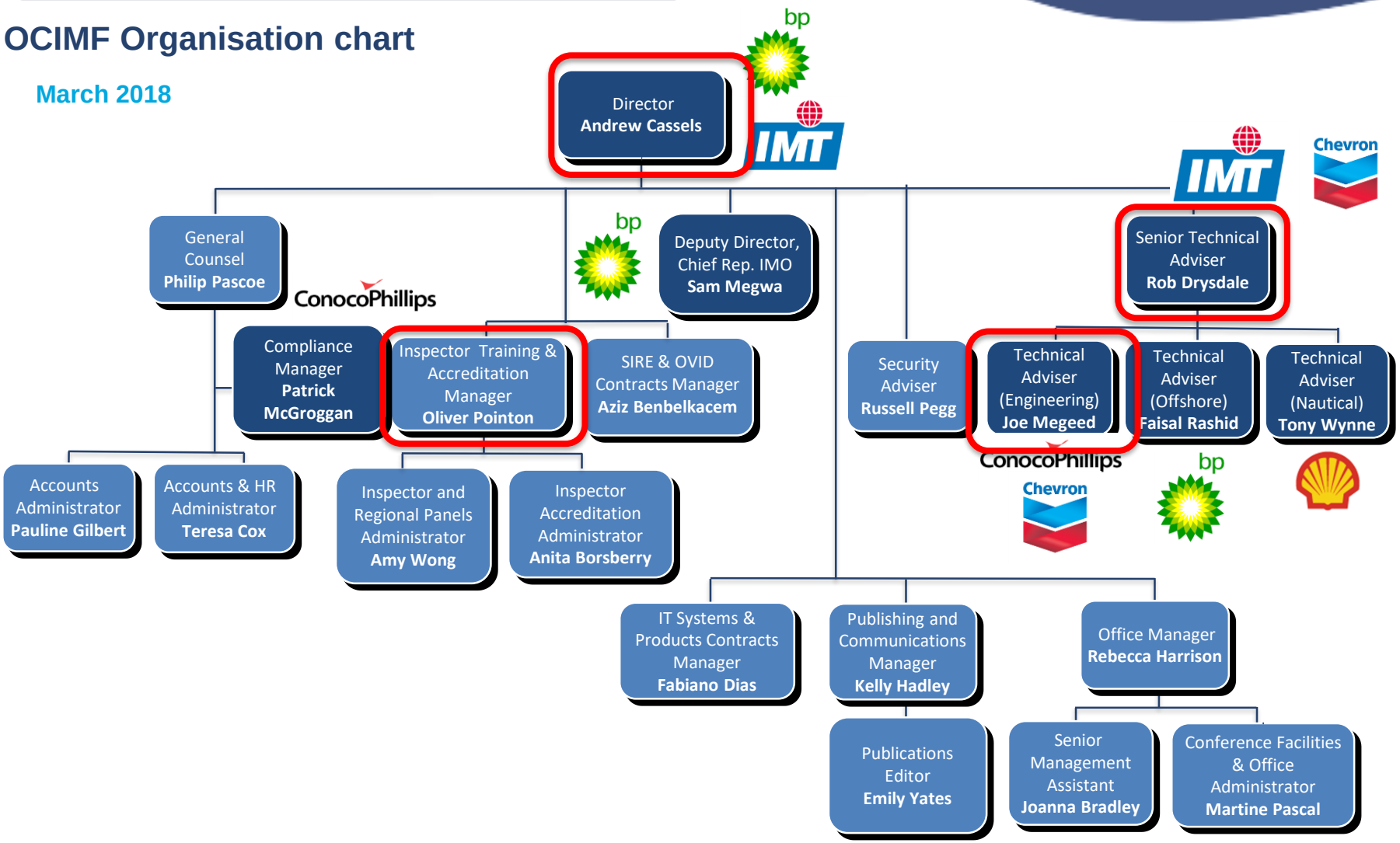


A Voice for Safety

OCIMF Secretariat

OCIMF Organisation chart

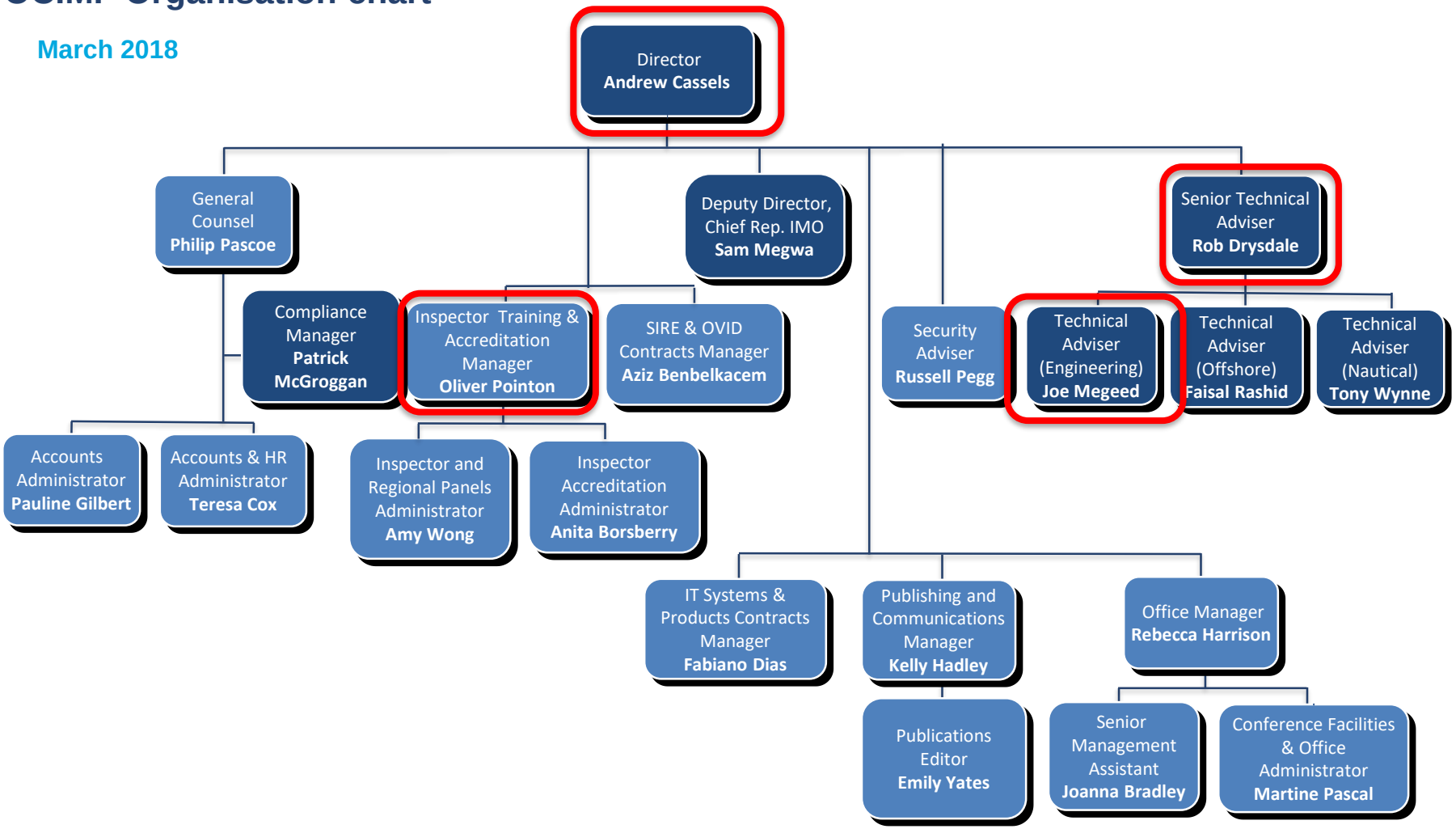
March 2018



OCIMF Secretariat

OCIMF Organisation chart

March 2018



New Staff

Chairman – Mark Ross (Chevron)

Director – Robert Drysdale (IMT)

New Staff

Deputy Director – Sam Megwa (BP)

Senior Technical Adviser – David Wall (Chevron)

New Staff

Offshore Adviser – Faisal Rashid (BP)

New Staff

Engineering Adviser – Ricardo Martinez (Chevron)

Inspector Training & Accreditation Manager – Ajay Gour